Abstracts from the Scientific Literature

Lyon P. Strean, D.D.S., Ph.D.

The Effect of Storage on Procaine-Epinephrine Solution

Costick, E. R., Anesth. & Analg. 35:457, July-Aug. 1956

■ Procaine solutions with and without epinephrine were assayed to determine the effect of long storage.

Discolored procaine solutions (2 per cent) containing epinephrine, 1:50,000, produced anesthesia of shorter duration than clear solutions.

Clear procaine-epinephrine solutions maintained their hydrogen ion concentration (pH) within acceptable limits even after storage for as long as 54 months.

Epinephrine, in the concentrations and under the conditions used in dental anesthetic solutions, has a short shelf life; however, no adverse effects were observed in experimental animals or humans when discolored solutions were tested.

Discoloration of procaine - epinephrine solutions seems to be the result of oxidation of the vasoconstricting agent. The shorter action of the anesthesia appears to be the only disadvantage attributed to the use of discolored solutions. The anesthetic potency is comparable to that obtained with procaine without added epinephrine.

While the use of discolored anesthetic solutions appears to be reasonably safe, one should not overlook the possibility of bacterial contamination and toxin formation as contributing factors. L.P.S.

Systemic Effects of Dental Local Anesthetic Solutions

Wallace, Donald A., Sadove, Max S., Spence, John M., and Gish, Gareth. Oral Surg., Oral Med. & Oral Path. 9:1297, 1956.

■ An investigation was undertaken to detect differences in systemic effect between 2 per cent procaine hydrochloride solutions with and without epinephrine, 1:50,000. A battery of physiologic criteria was employed to determine the actions exerted by the epinephrine systemically. Data were obtained in 56 experiments involving 19 dental students between the ages of 22 and 31 years. Subjects were given no other treatment and were kept in a resting state during the experi-

ments. The solutions were injected for mandibular block anesthesia in an alternating pattern.

Conclusions: "A controlled investigation, conducted on a blind basis, did not reveal clinically significant differences in systemic effect between 2 cc. doses of 2 per cent procaine hydrochloride solutions with and without epinephrine. Tracings from the finger plethysmograph, pneumograph, electroencephalograph, and electrocardiograph, and data on blood pressure were used as criteria. Psychologically-induced systemic effects were observed."

Causes and Prevention of Prolonged Apnea with Succinylcholine

Foldes, F. F., Rendell-Baker, L., and Birch, J. H.

Current Researches in Anesthesia & Analgesia 35:609, 1956.

■ Soon after the introduction of succinylcholine and its diethyl derivative, suxethonium, into anesthesiology, several cases of prolonged apnea were reported following its use. The frequency of appearance of those reports was such that it seemed doubtful that this valuable agent would keep its place among the clinically employable muscle relaxants.

After a thorough investigation of succinylcholine apnea, the authors were able to draw several conclusions indicating that this complication is preventable.

1. Succinylcholine apnea is not a pathologic entity, but rather it is a syndrome that can be caused by a variety of mechanisms.

2. Apnea occurs most frequently in fragile, debilitated, chronically-ill patients who usually have some serious gastrointestinal lesions associated with fluid and electrolyte disturbances. Occasionally, apnea may occur in seemingly healthy and fit individuals.

3. Low plasma cholinesterase levels may prolong the response to normal doses of succinylcholine, but it is unlikely that they will cause alarmingly prolonged apneas.

4. A combination of low plasma cholinesterase activity and decreased urinary excretion is most frequently responsible for prolonged postoperative apnea after large doses of succinylcholine.

5. Other mechanisms that may be responsible include: (a) depression of the respiratory center by succinylcholine itself; (b) depression of the respiratory center by the general anesthetic agents used; (c) interference with the activity

of the respiratory center by acapnea, hypercapnea and depression of exhaustion of the Hering-Breuer reflex; (d) failure of redistribution of succinylcholine from the end-plate; (e) pathologically altered response of the neuromuscular junction or the muscle fiber to the muscle relaxant; (f) persistent changes in the end-plate after removal of the drug.

6. If succinylcholine is used correctly and respirations are assisted, rather than controlled, succinylcholine apnea is a preventable complication.

Since patients developing this complication may be chronically ill, with demonstrable gastrointestinal lesions, it is conceivable that such physiologic stress could result in hyperactivity of the adrenal cortex. The fluid and electrolyte disturbances with mineralocorticoids and the gastrointestinal lesions may reflect increased secretions of glucocorticoids.

L.P.S.

Postanesthetic Nausea, Vomiting, and Retching

Knapp, M. R. and Beecher, H. K., Jour. Amer. Med Assn. 160:376, 1956

■ The mechanism of postanesthetic nausea, vomiting and retching has not been thoroughly explained. Various drugs have been used to depress the vomiting center.

The antiemetic effects of Dramamine®, Thorazine®, and Nembutal® were evaluated in surgical patients who had received nitrous oxide-oxygen-ether anesthesia. All of the drugs produced nervous system depression in varying degrees, as measured by postanesthetic recovery time. Retching and vomiting during the first four postoperative hours were not significantly reduced by either Dramamine® or 100 milligrams of Nembutal®. However, Thorazine® and 150 milligrams of Nembutal® were effective in relieving symptoms. The drugs produced significant hypotension.

Despite the significant protection against postanesthetic emetic symptoms provided by 50 milligrams of Thorazine® or 150 milligrams of Nembutal®, the side effects of prolonged awakening time, which leads to stasis of bronchial secretions, and increased hypotension make routine use of the drugs undesirable.

Postoperative hypotension may be a serious problem and the addition of a new factor leading to this state is unwise. L.P.S.

Preoperative Chlorpromazine in Poor-Risk and Uncooperative Mentally Deficient Patients

Jackson, T. L., Carson, J. M. and Tarjan, G.—A.M.A. Arch. Surg. 75:118, 1957

■ Chlorpromazine was given preoperatively to 25 poor-risk and uncooperative mentally deficient patients requiring minor surgery or dental care. The patients, ages 5 to 54 years, had an I. Q. range from 10 to 76. Chlorpromazine was given in a dose of 6 to 50 milligrams intramuscularly, the majority receiving 25 to 30 milligrams. Nine patients received additional oral medication with chlorpromazine.

Nineteen (76 per cent) were considered successes, four (16 per cent) failures and two (8 per cent) partial failures. All the failures had an I.Q. below 25. Best results were obtained in patients with an I. Q. above 40. The author states that these observations suggest that the drug may serve a useful purpose in apprehensive patients with normal mentality.

No lasting complications occurred. The most common side effect was a drop in blood pressure, two patients bordering on circulatory collapse.

Nisentil: Its Effect on Attitude of Patients Undergoing Surgery

Walter, T. H., Mayer, H. D., and Johnson, C. L. - Anesth. & Analg. 35:369, 1956

■ In clinical trials using alphaprodine hydrochloride (Nisentil hydrochloride) for the relief of pain and alleviation of apprehension, this drug was employed as the sole anesthetic agent in 199 patients undergoing various operations, including 38 patients requiring dental surgery. A minimum of resistance and pain was observed in 186 instances. Thirteen patients found the analgesic and sedative action less than satisfactory. No allergic or toxic manifestations were observed.

Alphaprodine may be administered either intravenously or intramuscularly, the former acting more rapidly. Repeated doses may be given to maintain its analgesic and sedative effects. It may be employed alone or in conjunction with other anesthetics. Its ease of administration, prompt action, and brief duration make it a flexible adjunct to surgical and other procedures.